C Canadian Pandemic Influenza Plan: Laboratory Procedures

In this document laboratory testing, surveillance and data collection, and communication issues are addressed for each WHO pandemic phase. The Laboratory Subcommittee has developed this document for pandemic planning purposes and to facilitate a consistent approach to laboratory testing for influenza during the interpandemic period.

WHO Phase 0

Interpandemic Phase

1. Testing

Normal activities to include virus isolation by cell culture, direct antigen testing, and serology. The Laboratory Sub-committee encourages the use of rapid detection methods in conjunction with cell culture to aid in the timely diagnosis of influenza particularly in outbreak situations. The nasopharyngeal swab is generally recommended as the preferred specimen as it gives the best results in most direct detection kits as well as in tissue culture. However, other specimens such as throat swabs or nasopharyngeal washings may be acceptable or recommended by specific kit manufacturers.

Participation in the National Microbiology Laboratory (NML) proficiency programme is required for all laboratories performing cell culture and/or serology for influenza.

Up to 10% of all season influenza isolates, including at least five early season, five late season, and any unusual isolates, must be sent to the NML for viral sub-typing. These isolates must be submitted to the NML promptly, along with the results of any sub-typing done locally. The NML should give priority to processing these specimens. NML will report results of sub-typing to the submitting lab within a few days of receipt. All laboratories performing cell culture for influenza are expected to submit isolates for sub-typing as described above unless otherwise directed by NML.

Susceptibility testing will be performed on early season and late season isolates as appropriate, as well as others agreed upon by the NML, in conjunction with the provincial laboratory.

The NML will transfer subtyping and susceptibility-testing technology to selected Provincial Health Laboratories (PHLs) as appropriate.

The NML will develop rapid test(s) for detection of influenza, better sub-typing and molecular and susceptibility methods, and offer training in these methods to PHLs as appropriate.

2. Surveillance and data collection

All testing labs must submit data on influenza testing to NML on a weekly basis, or more frequently if requested by the NML, during the influenza season. This data is reported on 'FluWatch' and accessible through the Health Canada and CPHLN websites.

Enhanced surveillance using sentinel physicians, and including laboratory testing, may be set up by NML in collaboration with local public health epidemiologists and provincial laboratories.

3. Communication

Enhanced communication must be set up by the CPHLN secretariat[1] to link the NML, PHLs and provincial epidemiologists using the CPHLN[2] website, email, fax and phone / teleconference communication. An up-to-date listing of laboratories must be maintained by NML and CPHLN.

Each province should have in place an influenza surveillance committee to ensure good communication between provincial epidemiologists, the provincial laboratory and the health units. The committee will deal primarily with influenza in the event of a pandemic, but will deal with other surveillance issues at other times as required. The committee should include (at a minimum) a provincial epidemiologist, the provincial laboratory director or designate, and the chief medical officer of health or designate.

4. Other

Laboratories will participate in regular disaster drills at the request of the National Pandemic Influenza Committee to test the plan and identify areas that need further attention.

WHO Phase 0, Level 1, 2

Novel Influenza Subtype Identified in One or More Human Cases

1. Testing

As in Phase 0.

Increased testing (particularly cell culture) to be encouraged to detect new virus rapidly. The NML to give priority to reagent preparation for the identification of the new strain in readiness for phase 2.

2. Surveillance and data collection

As in Phase 0 with heightened surveillance as determined by the NML and the Pandemic Influenza Committee.

3. Communication

Information from WHO, CDC, NML, or laboratories from areas affected by the new virus (information such as subtype, best cell lines to use, usefulness of direct testing, susceptibility pattern, morbidity, mortality, etc.) to be rapidly disseminated to PHLs by CPHLN secretariat using the CPHLN website, fax, email or telephone, depending on the circumstances.

PHLs will ensure that other testing labs in province are kept informed.

Meetings, teleconference of the laboratory subcommittee or the PHLs, will be coordinated as required by the CPHLN secretariat.

WHO Phase 0, Level 3
Canadian Human-to-Human Transmission Confirmed

1. Testing

Increased testing (culture) will be required to detect the first isolate of the pandemic strain in Canada. Additional supplies of appropriate cell lines may be required.

NML will provide to PHLs reagents for identification of the pandemic virus, advise on cell lines, use of rapid test methodologies and biosafety level required etc.

Rapid sub-typing of isolates will be performed by NML and designated PHLs.

Note that supplies, including cell lines, test kits, and reagents may be in short supply as other North American labs gear up as well. NML should consider in house production of alternate sources of reagent. Also PHLs currently producing their own cells might act as suppliers to other PHLs temporarily.

2. Surveillance and data collection

As in Level 1 and 2 with heightened surveillance as determined by the NML and the Pandemic Influenza Committee

3. Communication

NML to rapidly inform labs of first identification of pandemic strain in North America *via* CPHLN, CPHLN website, CPHLN listserv fax, email, or telephone as appropriate.

NML to keep PHLs informed *via* CPHLN, CPHLN website, CPHLN listserv, fax, email, telephone re: activity of new virus, keep updated on cell lines, direct test methods which can be used. The PHLs will rapidly communicate via NML their first isolate of pandemic strain, as well as any other local influenza activity.

PHLs to ensure other testing labs in province are kept informed.

WHO Phase 1,2,3
Pandemic in Canada

1. Testing

The PHLs will be handling increased testing during this phase of pandemic; they will need to redirect resources to give priority to influenza testing. Each laboratory will decide how to ensure influenza testing gets priority (e.g., restricted testing of other specimens, additional staffing, etc.)

Biosafety level required will be reassessed by NML and CPHLN using information from WHO and CDC.

Rapid sub-typing of isolates by NML (and designated PHLs).

Susceptibility testing of strains as determined by NML in collaboration with the PHLs.

2. Surveillance and data collection

Continued heightened surveillance as in Phase 1 and 2.

3. Communication

As in Phase 0

NML will rapidly inform the PHLs of the first appearance of pandemic strain in Canada.

NML will collaborate with the provinces to notify bacteriology testing labs to prepare for an increase in testing for bacterial pneumonia (i.e., strategy for monitoring types of organisms, susceptibility patterns, and best antibiotics to use).

WHO Phase 4

Second or Later Waves in Canada

1. Testing

PHLs may have to restrict testing of specimens for influenza. The Laboratory Subcommittee to give guidelines on testing, depending on antiviral susceptibility of pandemic strain and other co-circulating strains.

2. Surveillance and data collection

As in Phases 1 – 3.

3. Communication

As in Phases 2 and 3.

The NML will keep the PHLs informed of influenza activity across the country, changes in susceptibility, other circulating strains, morbidity/mortality information, etc.

WHO Phase 5

Post-pandemic Period in Canada

Return to pre-pandemic activities.

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1. The reason for using the CPHLN secretariat and the CPHLN website is because of the secretariat's role in communication among all PHLs and the NML as well as with CIDPC and others.
2. The CPHLN website is a more appropriate tool because its website does not dilute critical lab-related issues with other concerns. The CPHLN website will deliver specific-up-to-date and real-time lab info as a one-stop-shopping-for-lab-information site. This site can be accessed by anyone who will need access. This does not exclude the use of HC website, but www.cphln.ca would be faster for laboratory personnel by design.